1965

Sorghum : Weed Control

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FS 261

SORGHUM

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Published and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914, by the Cooperative Extension Service of South Dakota State University, Brookings, John T. Stone, Director, U. S. Department of Agriculture cooperating.
5M—2-65—File: 15.144—2045

Sorghum

Weed Control

For many years sorghum was planted and cultivated with corn planting and cultivating equipment. Good weed control was difficult to obtain because the crop could not be cross cultivated. Better annual weed control has been obtained with a rotary hoe, flextine harrow, and herbicides. Using corn planting equipment made it essential to plant sorghum in 40- to 42-inch rows; these newer implements and herbicides can be used on sorghum planted in narrower rows. Even though these newer weed control methods are very helpful, it is frequently necessary to use at least one row-crop cultivation to get good weed control.

ROTARY HOE

The rotary hoe controls annual weeds early in the season. Its efficiency depends on pulling it at a speed of 8 to 10 miles per hour when the weeds are just emerging. Use a shield over the hoe or behind the tractor driver's head as protection from flying clods and stones. It is most effective if the soil is crusted as a result of drying after a rain; but it is also effective on moist soil. It may cover small plants growing in furrows, wheel tracks, or loose soil. If crop plants are large, hoe during the heat of the day to prevent breaking plants.

A much larger acreage can be hoed than can be row crop cultivated in the same time. Although several hoeings are generally needed to replace one row crop cultivation, two hoeings can be done for approximately the same cost as the first row crop cultivation. (The first cultivation is slightly higher than later cultivations.) The rotary hoe is generally not effective if weed seedlings are big enough to develop a green color.

FLEXTINE HARROW

The flextine harrow is used much the same way as the rotary hoe except that it is operated more slowly. It is most effective at 2 miles per hour or less. The rotating action of the flexible tines make it effective for killing weed seedlings. As with the rotary hoe, a much larger acreage can be covered than with the row crop cultivator. Several harrowings are generally needed to replace one row crop cultivation, but three harrowings can be made for about the same cost as the first cultivation. The harrow is most effective on weed seedlings ¼ inch high or less.

COSTS OF CULTIVATION

If labor is not considered, the cost of rotary hoeing is about 45 cents per acre, while the flextine harrow costs 21-24 cents per acre, and row-crop cultivation costs about 66 cents. If labor is worth $1.25 per hour, the costs increase to 67 cents, 35 cents, and 91 cents per acre, respectively. The first row crop cultivation takes longer than others and the cost would be some higher than the 66 or 91 cents quoted here. Consequently two rotary hoeings or three harrowings can be done for approximately the same cost as the first row-crop cultivation.

SPRAYING WITH 2,4-D

Spray with ⅓ pound per acre of an ester of 2,4-D or ½ pound with an amine of 2,4-D when the sorghum is 4-12 inches tall to base of uppermost leaf to control broad leaved annual weeds.

2,4-D is used for controlling broad leaved weeds in sorghum. Forage sorghums are generally more tolerant than grain sorghums to 2,4-D unless the forage sorghums are grown for seed. Forage yields are seldom reduced by 2,4-D application, but treatment at the wrong time may decrease grain yields greatly.

Do not spray sorghums before they are 4 inches tall. Both forage and grain sorghums can be severely injured and sometimes killed if treated at this stage. The best time to spray is when plants are 4-12 inches tall. These heights are determined by measuring from the ground up to where a new leaf is emerging. An application of ⅓ pound of 2,4-D acid in ester form or ½ pound in amine form during this period seldom causes a serious yield reduction. However, brace roots are sometimes injured. Severe injury may result in lodging.

Grain sorghum is in the most susceptible stage of development when approximately 12 inches tall. The head begins to develop within the plant only a few inches above the ground. Use a sharp knife or razor blade to slit the stalk. If the head can be seen, do not spray with 2,4-D.

Severe damage to grain yield results from 2,4-D application at the time that the sorghum is heading.

Little damage occurs from spraying after the grain has started to form. When the sorghum has reached this stage, annual weeds have already done their damage, but high clearance sprayers with drop nozzles should be used to spray perennial noxious weeds.

ATRAZINE

Use 2-3 pounds of active ingredient per acre to control foxtails, barnyard grass, pigweed, mustard, lamb's quarters, Russian thistle, kochia, and other annuals. Use the lower rate on light soils and the higher rate on heavy soils. Spray when sorghum seedlings are 2-4 inches tall and weeds are less than 1" high. Treat 8- to 14-inch bands over the rows. Rotary hoe or harrow 2 weeks later if less than ½ inch of rain falls during the 2-week period. Follow up with needed hoeing, harrowing, or row-crop cultivation. Do not graze or feed sorghum forage treated with atrazine to livestock.

This herbicide controls most annual grasses and numerous broadleaved annuals. Pre-emergence applications frequently injure sorghum. The best time to spray is when sorghum seedlings are 2-4 inches tall and weeds are less than 1 inch tall. Atrazine kills the weed seedlings present at time of spraying, but ½ to ¾ inch of rain is needed during the next 2 weeks to kill later emerging weeds. If less than ½ inch of rain falls within 2 weeks after application, rotary hoe or harrow to kill later emerging weeds. The tillage kills some seedlings and helps activate the herbicide to kill others. To get effective weed control, higher rates of atrazine are needed on heavy soils or high organic matter soils than on light soils or low organic matter soils.

Residue from over 1 pound per acre of this herbicide applied in sorghum 1 year generally damages the crop planted the next year. Damage from residue is reduced if the herbicide is applied in bands over the rows. Less area is covered and tillage, diagonally across the field, the following spring dilutes the residue by mixing treated soil with untreated soil. In one test, plowing reduced residual effect more than disking did.

Although an over-all application will replace one and sometimes two cultivations, the cost of the herbicide and the carry-over effect from chemical residues generally make it impractical to use such a treatment. Since the equivalent of two row crop cultivations will generally be needed anyway, they will kill weeds between the rows.

Sprays may be applied with a regular field sprayer that has nozzles spaced the same width as the rows. Be sure that you have good agitation in the sprayer tank to keep atrazine in suspension. Use 15-20 gallons of water per acre on area treated. Use special nozzles that give uniform coverage over the entire width of the band and use 50-mesh nozzle screens. Nozzles on regular field sprayers are designed to overlap and deliver low volumes of water. Consequently, they do not give uniform coverage over the swath of any one nozzle. They are also equipped with fine screens.

CDAA

Use 4 pounds of active ingredient per acre of CDAA to replace first cultivation for controlling annual grassy weeds. Granules are recommended in preference to sprays. Apply in 8- to 14-inch bands over the rows. Follow up with needed cultivations with rotary hoe or flextine harrow and row-crop cultivator.

This chemical controls most annual grasses if applied pre-emergence to warm soil (60-65 F.) and if a minimum of ½ to ¾ inch of rain falls during the first week after application. CDAA generally gives better weed control on heavy soils high in organic matter than on light soils low in organic matter. It is relatively volatile and relatively emulsifiable in water. Therefore, it must be leached into the soil before it volatilizes, but heavy rain (2½ inches) may leach sprays beyond the root zone of weed seedlings.

Granules are effective over a wider range of conditions. They are effective if applied to cool soil, are not rendered ineffective by heavy rains, and are effective if rain is not received for 10 days or 2 weeks.

Rainfall records during 1952-61, indicate that the rainfall at sorghum planting time would have been adequate to activate CDAA sprays and give good weed control in eastern South Dakota 5 out of the 10 years. Granules would have been effective 7 or 8 years.

CDAA gives weed control for a shorter period of time than atrazine and does not give good weed control as often as atrazine, but does not leave a chemical residue that will damage next year's crop.

CDAA spray has a repulsive odor and is very irritating to the skin. The fumes irritate the eyes. Granules are much less irritable to handle. If you use a spray, wear goggles and protective clothing when spraying. You may want to use rubber gloves and a respirator when putting the chemical into the sprayer.

An over-all application seldom replaces more than the first row-crop cultivation. Since cultivations are generally required to give good weed control, they will control weeds between rows and there is no point in making over-all treatments.

COST OF HERBICIDES

The cost of application is very small if applied with a planter attachment; however, it is about 75 cents per acre if a field sprayer is used after planting.

The cost of 2,4-D is about 90 cents a pound or 25 to 30 cents an acre for the control of annual broad-leaved weeds.

A wettable powder of atrazine (trade name Atrazine 80W) containing 80% active ingredient costs about $2.85 a pound of product or $3.56 per pound of active ingredient (atrazine). A spray application of 3 pounds of powder (2.4 pounds active ingredient) costs about $8.50 for the herbicide on each acre of area treated.

If the field is treated in 12- to 14-inch bands over 40-inch rows, the cost of herbicide is $2.85 for each acre in the field. With 8-inch bands the cost is reduced to $1.70 per acre of field on 40-inch rows and $3.40 for 20-inch rows.

Liquid CDAA (trade name Randox) costs $7.65 for a gallon containing 4 pounds active ingredient. A spray application of 1 gallon per acre costs $7.65 for each acre treated. If the herbicide is applied in 12- to 14-inch bands over 40-inch rows, the cost for each acre in the field is $2.55. With 8-inch bands the costs are $1.53 per acre of field for 40-inch rows and $3.06 for 20-inch rows.

Granules of CDAA contain 20% active ingredient and cost 44 cents for a pound of granules or $2.20 for a pound of active ingredient (CDAA). A granular application of 20 pounds of granules (4 pounds active ingredient) costs $8.80 for herbicide on each acre treated. If they are applied in 12- to 14-inch bands over 40-inch rows, the cost for each acre in the field is $2.93. In 8-inch bands the costs are $1.76 for 40-inch rows or $3.52 for 20-inch rows.